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(54) **COARSE FREQUENCY OFFSET ESTIMATOR IN ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING RECEIVER AND METHOD THEREOF**

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(57) **ABSTRACT**

Coarse frequency offset estimation method and device in an orthogonal frequency division multiplexing (OFDM) receiver are provided. The coarse frequency offset estimation device includes a buffer for receiving demodulated symbol X(k) and cyclic shifting the symbol X(k) by a predetermined shift amount d and outputting shifted symbol X(k+d), a reference symbol generator for generating a reference symbol Z(k), a counter for counting the shift amount of d, a partial correlation for receiving the shifted symbol X(k+d) and the phase reference symbol Z(k) and calculating a partial correlation value

$$\sum_{m=0}^{K-1} \left| \sum_{k=m(N/K)}^{(m+1)(N/K)-1} X(((k+d)_N)Z^*(k)) \right|$$

with respect to K divided bands, wherein a range of shift amount d is between −N/2 and N/2, and a maximum detector for obtaining a shift amount of d by which the partial correlation value is maximum, and outputting the shift amount of d as an estimated coarse frequency offset value. Thus, stable coarse frequency offset estimation can be performed by a small number of calculations.

6 Claims, 8 Drawing Sheets

BANDWIDTH [MULTIPLE OF SUB-CARRIER INTERSPACING]

FRAME TIMING OFFSET [SAMPLE]